

INTRODUCTORY LECTURE

TO A COURSE OF LECTURES ON

HYGIENE AND PUBLIC HEALTH.

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BY

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GENTLEMEN,—Last summer, in commencing my course of lectures, I considered myself called upon to make a kind of apology for the existence of a Chair of Hygiene at all, and to explain why it was "thought necessary to add another to the many courses of lectures which you already attend"; now, happily, this is no longer necessary, as the science of hygiene is gradually becoming recognised here, as it has always been in the continental schools, as one of the most necessary subjects of study in the medical curriculum.

What, then, are the objects of hygiene? How can we define it? The usual definition of it is—"Hygiene is the art of preserving the health." But this explanation, comprehensive as it is, is yet hardly comprehensive enough, or rather does not sufficiently specify the means by which the end of the science is to be attained, and so leaves the mind in doubt as to what sort of researches have to be made in order to further the knowledge of the subject.

Londe, apparently from a dietetic point of view, proposed the following definition: "Hygiene is the science which has for its object the direction of the organs in the exercise of their functions." But this limits the subject too much, and really excludes the most important and interesting part of it.

Oesterlen, a well-known German medical writer, recognises in his definition the two great divisions of hygiene; he calls it "that part of our knowledge which has to do with the preservation and furthering of the health of individuals on the one hand, and of the community at large on the other."

Michel Lévy says that it is "the clinical study of healthy man", by which definition he wishes to individualise the more general one; but even here we do not find what we want; indeed, we prefer the original definition to all these alterations of it. Dr. Parkes thinks so too, for he says "hygiene is the art of preserving health; that is, of obtaining the most perfect action of body and mind during as long a period as is consistent with the laws of life; in other words, it aims at rendering growth more perfect, decay less rapid, life more vigorous, death more remote."

And now we come to the extension which Bouchardat has given to the ordinary definition: "Hygiene is the art of preserving the health." But how can we preserve health? Plainly by doing our best to keep away disease. And how can we do this? By checking the causes of disease. To this end we must know these causes; and here we have the grand object of hygiene: it is the science which studies the *causes* of disease, and points out the means of avoiding them.

The knowledge of causes is the great aim of all science properly so called; and no subject ought to be honoured with that name which has not this end in view. "Prevention is better than cure" is an old proverb and a very true one; and it is prevention that we shall study here, prevention of disease of whatsoever kind by the removal of its causes.

Do I hear any one say, "That is not our business; we have to learn how to *cure* disease when it has arisen"? Quite true; but not the whole truth. Our business as medical men is to *cure* diseases ("if medicine means anything", as has been well said, "it means the art of healing"); but our duty as educated members of society, who by reason of our calling know more of the evils to which man is liable and of their causes than others do, is to do all that lies in our power to *prevent* disease; and it is therefore our duty to give special attention to the science which studies the causes of diseases, and shows how they are to be avoided. But beside this, there is another side of hygiene—the therapeutical side of it, if I may so call it—which is of the utmost practical importance to the medical man, and the neglect of which in our times has been attended with the most baneful effects to the medical profession as well here as abroad. Let us hear what Fonssagrives, the Professor of Hygiene at Montpellier and the Physician-in-Chief of the French Navy, says on this point: "It has cost very dear to rational medicine to be thus separated from hygiene. Two systems equally exclusive, and susceptible of impressing the vulgar mind by their extreme simplicity as much as by their paradoxical attractions, have found in

this way an excellent pretext for coming to light; and homœopathy as well as empirical hydropathy have come to remind it in an opportune manner, that if medicines have power to cure, moral influences and hygienic modifiers are also levers on which we must rely." He then goes on to say that methodical hydrotherapeutics, applied in a rational manner, have become a part of scientific medicine, to remain so for ever; but that homœopathy, with its irrational and utterly unscientific notions, is destined to remain for ever out of the domain of medical science.

Thus we see that hygiene, besides studying the causes of disease, and the methods of avoiding it, and of so preserving a state of perfect health, takes also into consideration the treatment of many forms of disease by methods other than the employment of pharmaceutical preparations. These methods are what the Professor above quoted calls "hygienic modifiers"; and are such as exercise, change of employment, sea-voyages, residence in a different climate, and, above all, regimen. Until within a few years, this last was the great object of hygienists; and the result is that most of the treatises on the subject contain nothing but innumerable empirical rules for the guidance of man during the different phases of his existence, and under the most diverse conditions, together with a mass of facts gathered from all directions among the physical sciences, and more or less connected with the subject. "Who does not see that there is not there anything like true science?" asks Royer-Collard; and again, "Who does not understand the urgent necessity of escaping from such a state of things, and of bringing back hygiene to the level of the other branches of medicine?"

What is it that has done this, and caused hygiene to become again one of the most important branches of medical science? It is the new direction that has been given to the science of health, by the recognition of the fact that its great object is to find out the *causes* of the maladies to which man is subject—and not only to find out those causes, but to make known the rational means of preventing or avoiding them, and thus to aid in prolonging the term of man's existence.

As the methods for the preservation of health are of the first importance to all human beings, we may expect to find provisions to this end among the writings of the ancients, especially in the codes of the lawgivers; and such is the case. Take the writings of Moses: they teem with most excellent hygienic regulations, which the people for whom he legislated were obliged to observe under pain of severe penalties. Look at the methods given for the prevention of the spread of leprosy, and for the purifications of persons and of dwellings. Why, many of them would do credit to any set of regulations on the subject that might be drawn up in the nineteenth century! Then the command not to eat swine's flesh; go into southern or eastern countries, and see what an infinitely disgusting creature the pig is in hot climates, and you will not fail to see the wisdom of that command. Indeed, it would be as well if such a law, or at any rate one to prohibit the sale of uncooked pig's flesh, existed in some countries not so far away from us as Arabia or Palestine. Consider, again, the prohibition of the marriage of near relations: how well the decline of the race—morally, intellectually, physically—is provided against by this regulation!

Besides these and many other important generalities, you will find the great Hebrew legislator descending to the inmost details of family life—giving a *régime* admirable in its adaptation to the climates of the countries for which it was intended, directing the burying of excrements and refuse-matter of all sorts *in the earth*, fixing the laws of marriage, of concubinage, of servitude, and of all social relations.

Again, look at the custom of circumcision, one of the most salutary regulations that was ever imposed on a people, especially in an eastern country, where the difficulty as well as the necessity of scrupulous personal cleanliness is so much increased; a custom that had originated among the people before the time of their lawgiver, and one which, Herodotus tells us, was in vogue among the ancient Egyptians, and which, as is not very generally known, is still practised by the natives of the island of Madagascar. What wisdom was shown by Moses, and by Mahomet in later times, in retaining this wholesome custom as a religious rite, and thereby securing its perpetuation.

It is to the strict observation of these sanitary regulations, that one of the best known writers on hygiene of the present day (M. Michel Lévy) does not hesitate to ascribe the singular immunity of the Jewish race in the midst of fearfully fatal epidemics, which immunity was so marked in the middle ages that it brought upon them "accusations the most absurd, persecutions the most atrocious." And I think that, in spite of the counter-criticism of the great hygienist Halle, who could find nothing reasonable in the regimen ordered by Moses, except the prohibition of swine's flesh, and who could not see any salutary motive for the rite of circumcision, we shall come to the conclusion, the more we study the laws of health, that his regulations were on the whole most wise, and that the observance of them has contributed not a little to form the

enduring character of that race, which, though scattered abroad on the face of the earth, and subjected at various times to fierce persecutions, whether on account of its religion or of its proverbial wealth, still exists, and not only exists but flourishes, retaining its peculiar characteristics in all their freshness during a period of three thousand years, and remaining as distinct from the other tribes of mankind as it was in the days of its wise legislator.

What a magnificent proof we have here of the influence of the due observance of the laws of health upon whole nations, and of the immense importance of their study, and especially of their general practical application both by individuals and by the community at large.

We turn now for a moment to China, and find a people in many respects in a very high state of civilisation—a people who had used the mariner's compass ages before it was known in Europe, but a people who, from want of communication with other nations, have made no advance at all, perhaps for thousands of years—who have gone on increasing at such a rate that they now form one-third of the population of the whole world, so that their country is crowded to an extent hardly conceivable. Surely we can learn something from them which will be of service to us in the management of the health of our overgrown towns. Yes, in one thing at least they are our masters. They waste nothing; what they take from the earth they give back directly to the earth. Every atom of their sewage-matter is employed as manure; and how otherwise would it have been possible for so immense a population, without any external resources, to live on such a comparatively limited portion of the earth's surface, and to keep it fertile for so many centuries? Thus we see that this people had actually solved, ages ago, in a most practical, and in many respects highly satisfactory manner, one of the greatest questions in hygiene, and one about which we "western barbarians" cannot yet make up our minds.

One of the best instances of the power of cultivation in improving the condition of a country is to be found in Lower Egypt, in ancient times the centre of the civilisation of the world, now for the most part in an abject condition. The inundations of the Nile, while the country was peopled with intelligent races, were the great source of its fertility, but are now the cause of the insalubrious marshes that generate the plague, and make that country one of the most unhealthy spots on the face of the globe. This fearful epidemic appears to have been unknown in ancient Egypt; at any rate, we have no mention of its existence there until some time after the Roman occupation; and it is not likely that so terrible a disease could have committed its ravages in a highly civilised country without any mention of it having been made.

To come nearer to our own country, let us see what were the hygienic conditions of ancient Greece and Rome. Had the practical application of the principles of public health anything to do with the high state of civilisation to which those countries rose, a state which in some respects, at any rate, has never since been equalled? Had it anything to do with the success which attended the Roman armies, and led to the formation of that enormous Roman Empire? Let the facts speak for themselves. In reading the classical authors of those countries, what strikes one most? Is it not the continual mention of gymnasia and of baths? A certain portion of time was set apart daily for exercise in the gymnasium, and thus a full development of the body was produced, and the greatest resistance given to those two great enemies of mankind, disease and death. It is true that all this training was part of a great military system, that the youths were thus encouraged to compete for the prizes in the Olympian games, and in the Roman gymnasium, that they might become good soldiers; but did this prevent the cultivation of mental acquirements? Again let the facts give the decision. Do you wish to see fine buildings—buildings so well constructed that they have lasted comparatively untouched by decay for centuries? Do you wish to study beautiful sculptures, statues anatomically perfect to the minutest details and of unsurpassed artistic elegance? You go to Athens! You go to Rome! Do not fancy that I am contending for bodily exercise against mental acquirements; I merely maintain that a sufficient daily exercise of the body is absolutely necessary for the proper performance of its functions, mental as well as physical, and that the best way of securing this amount in the smallest time is the employment of a regular system of gymnastics.

But we have not yet done with Rome. I have mentioned the baths of that city. How were they supplied with water? Ah! here we have need to hide our faces with shame. Surely we, with all the immense advantages of scientific methods, manage to supply our cities with water as well as the people of two thousand years ago and more—at any rate, with all our steam engines and manufactories, we require at least as much as they had. Turn to the pages of Frontinus, and what do you find? That, at the time at which he wrote (about A.D. 92), there were actually nine large aqueducts by which water was brought into Rome, beside some smaller channels; these aqueducts were in some instances,

entirely covered over throughout their whole length, and were placed underground or supported by high arches, as occasion required. Several of them, as the Anio Vetus, the Claudian and the Anio Novus were from forty-two to forty-nine miles in length, and the total length of the Marcian was actually fifty-four miles. The water was brought by the two Anios from the river Anio, by the others from various springs and lakes around Rome; the two newest ones were made because "seven aqueducts seemed scarcely sufficient for public purposes and private amusements."

How much water was brought to the city by these beautiful constructions, the ruins of which form to this day so conspicuous and interesting a feature in the scenery of the Roman Campagna? We have fortunately very accurate measurements given us by Frontinus himself, who was, I should tell you, the controller of the aqueducts, by which we can calculate the amount approximately. We find that the sectional area of the water supplied by all the aqueducts was 24.805 quinaries, or about 120 square feet; and, says Mr. James Parker, "we can form some notion of the vast quantity if we picture to ourselves a stream 20 feet wide by 6 feet deep constantly pouring into Rome at a fall six times as rapid as that of the river Thames." The supply appears to have been equivalent to more than 332 millions of gallons per day, or (since the population was certainly not more than a million) at least 332 gallons per head per day—about ten times the amount that we have now in London or Paris.

Many of the other great cities of the Roman Empire were supplied with water in the same manner. Lugdunum (Lyons) had three fine aqueducts, of which one, underground during the greater part of its course, is even now probably almost intact, while another was constructed across so irregular a country that its remains fill our modern engineers with astonishment. Look at the Pont du Gard near Nîmes, the most perfect, and in some respects the most wonderful, Roman remain (I cannot call it ruin) in the world; what is it but a stupendous aqueduct, across a valley where it was not considered advisable to resort to the system of inverted syphons practised at Lugdunum?

Come with me along the north coast of Africa for a few moments, and we shall find remains of Roman aqueducts near to Tunis, where they have been rebuilt and are still used, at Bona (with fine cisterns), inland at Constantine, and at other places. What remains of the ancient splendour of mighty Carthage? Nothing but a series of magnificent water-cisterns, with the huge remnants of the aqueduct that supplied them.

I have gone thus far into the account of the water-supply of the ancient Roman cities, because it affords the solution to one of the greatest questions of the present day in London and in large towns generally. The only cities that are well supplied with pure water now, are those where the method is employed that was decided upon at Rome more than three hundred years before Christ.

But, beside the aqueducts, there was a capital system of sewers at Rome, consisting of the Cloaca Maxima and a series of smaller sewers running into it. The Cloaca Maxima ran (or rather runs) from the Forum to the Tiber, into which it discharged (or rather discharges) the sewage and other refuse matter of the city; while the sewage-matter of those parts of Rome not supplied with sewers was carried off in carts in the night, precisely as it is now in many parts of Paris by the only too well known Compagnie Richet. Of course this was another branch of the public service, and was given over to the "Curatores Cloacarum", as the charge of the aqueducts was to the "Curator Aquarum".

The above remarks will give you an idea of the admirable manner in which the means for the conservation of the public health were made a subject of State legislation in ancient Rome, and of the determined way in which all obstacles were vanquished in order that the city might be made as healthy as possible.

Not only have we the example of the ancients in these matters, but we have hygiene reduced to a system by Hippocrates. Read the first section of his *Aphorisms*, and you will be struck by the excellent dietetic regulations which he gives for the observance of gymnasts, and for the guidance of physicians in treating acute and chronic diseases. Read also his third section, on the Influence of the Seasons of the Year and of Age in the Production of diseases. In his other treatises, he gives the same importance to regimen, and accurately describes the effects of variations in the quantity and quality of different kinds of food and drink on healthy people. The very names of the works of Hippocrates show you how great a hygienist he was: "About Diet," "About Diet in Health," "About Diet in Acute Diseases," "About the Use of Liquids," "About Food," and especially the one on "Air, Water, and Localities." So that, when I claim him as the father of experimental hygiene, you see that I have good reason for doing so.

After Hippocrates comes Celsus, who gives up the first chapter of his first book *de Re Medicâ* to the exposition of rules concerning diet,

and recommends avoidance of too great regularity by healthy persons. He also discusses the influence of temperaments and idiosyncrasies; and points out that every one has a weak point in his constitution, to which he must especially attend, in order to ward off the diseases to which he is most liable.

But we must not omit to notice Galen, whose works exercised so enormous an influence on the medical practice of the whole world during many centuries. He was born at Pergamos, but travelled a great deal, and was appointed physician of the gymnasia at Rome. He is noted for his love of divisions and classifications. Thus he divides men into various classes, and assigns to each its diet. Therapeutic agents, too, he subdivides in a curious manner.

The doctrines of these fathers of medicine, mixed with the fancies of later times, were spread abroad over Europe by the Sicilian school, which was the offspring of the ancient Greek and Arabian medical schools. Its practice is handed down to us in a quaint Latin poem, in which a great deal of truth is mixed up with a great deal of trash, and in which we find bad therapeutics based upon faulty pathology. Thus we see that the experimental methods of Hippocrates and his successors were confused with a host of traditions derived from the Arabian alchemists, who had announced that they had found a substance that would cure all diseases and turn common metals into gold. This dangerous influence of the astrology and alchemy of the Arabian philosophers remained in the medical world up to the sixteenth century; and its effects continued much longer, so that the rational methods of treatment adopted by the ancient physicians were neglected, and diseases were treated, instead, by a number of supposed infallible remedies, of which the action was not at all investigated. And what do we find as the result of this change of practice? That epidemics raged with the most fearful intensity all over Europe—epidemics which were only known accidentally before, and which, finding favourable conditions for their spread in the utter neglect of hygienic observances, came from their natural seats in hot eastern countries, and committed unheard-of ravages in Europe. Look at the plague—that fearful epidemic of the eastern part of the Mediterranean: it is true that we have accounts of terrible visitations of it in Greece, and particularly of one which depopulated the city of Athens in the second year of the Peloponnesian war; but then remember that at this time the city was crowded to a fearful extent by the inhabitants of the country that Pericles had summoned into it; and it was at this juncture that the pest was introduced by a ship that entered the Piræus from Egypt. At various times, and particularly in the year of the city of Rome 389 (before the building of the aqueducts), the Roman capital was visited with the same calamity. But all this is nothing to the fearful visitations with which the whole of Europe was afflicted during the fourteenth, fifteenth, sixteenth, and seventeenth centuries.

In 1348, the plague appeared in Asia, Africa, and Europe; and actually slew, according to Froissart, forty-three millions of human beings. From this time, it cannot be said to have permanently ceased in Europe for centuries; it merely changed its sphere of action from one country to another. Between the seventh and the seventeenth centuries, England was actually invaded twenty times by this disease. Was any class of the population less attacked than the rest? Yes, the only part of the people who by their religious belief were obliged to follow, more or less strictly, a code of excellent hygienic regulations—the Jews—experienced so singular an immunity from these epidemics, that they were actually accused of causing them by spreading poisons in the air, and were burnt as wizards in almost all the countries of Europe. The last appearance of the pest in Europe was in 1719, when it was introduced into Marseilles by a ship that had been refused admittance into the port of Cagliari, in Sardinia. Even then, its course might probably have been stopped, had its malignant nature been recognised soon enough; but this was not the case, and more than ninety thousand persons were killed by it. After this, most energetic measures were taken to prevent its reintroduction into Marseilles; and it has not yet reappeared there. Here we have a clear case of the value of prevention. Sardinia was saved because the king refused the admission of the ship into the harbour of Cagliari; Marseilles was ravaged because such preventive measures were not taken.

From this time, public hygiene received still more attention in France, where, however, as early as 1350, Jean le Bon had instituted a sort of system of officers of health; and we find, towards the end of the eighteenth century, the Royal Society of Medicine founded, the reports of which contain valuable collections of facts relating to various departments of public health. Later on, the Council of Salubrity of Paris was founded, and took under its cognisance all questions relating to hygiene. Similar societies were founded in the other large towns, and thus by their reports an accurate account of the sanitary state of France was obtained in 1851.

In England, we are accustomed to manage such affairs in a less official manner than they are done abroad; and the result is, that improvements, although more difficult of introduction, are often more surely brought about with us than with our neighbours. It is certainly not because we are less hygienic in our habits than other nations, that we have so few books on hygiene, or that our medical schools have never looked upon it as a sister science with medicine; but because it seemed to take no special line; because it seemed to be so much everybody's business. Now, however, as we shall soon see, since the formation of the General Board of Health and of the Registrar-General's Office, such a mass of information with regard to the statistics and to the causes of disease has been obtained, that it seems necessary to make a special study of this science, and no longer to allow it to be taught accidentally, as an appendage to pathology or therapeutics.

[To be concluded.]

CLINICAL OBSERVATIONS ON DISEASES OF THE SKIN.

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ICHTHYOSIS.

THE least in frequency, but not in point of interest, of the squamous class of skin-affections, is Ichthyosis, a curious disease when seen in certain examples. The name, derived from a supposed resemblance which its scales bear to those of a fish, refers rather to their abundance than arrangement, as the absence of any imbricated method marks the complaint in every stage and variety. In many cases the scales are very thick, disposed as so many small squares, and often rendered dark, or nearly black, from constant exposure. They are especially developed in the immediate vicinity of the larger joints, as the elbows, hips, knees, and ankles; occasionally also are they found in the axillæ, and around the circumference of the nipple in females. A good illustration of ichthyosis is afforded in the following case of S. B., a girl 14 years of age, who was formerly an in-patient of the Skin Disease Hospital. The scales covered every part of the body, except the soles of the feet and the palms of the hand, where the skin was only rough; they were also absent on the ball of the thumb and the upper lip. Their greatest development was attained on the hips and elbows; but the neck, back, and chest, were severely attacked. The large scales, it may be noted, were, many of them, irregularly fissured, and others curled at their margins. Thickest on the knees, they existed as large flakes on the abdomen and the thighs. The forearms on either aspect were covered with dark rectangular scales, which became circular or oval towards the wrist, and slightly depressed in their centre. Such are the ordinary characters of ichthyosis. Many instances occur, however, no less typical than the preceding, from which they differ chiefly in the disposition of the scales. These are remarkable for their size and tenuity, as well as for the rapidity with which they are shed and again renewed. The skin also inclines to a reddish hue, as in the following case.

Barbara C., aged two years, was brought to the Hospital on August 21st, 1867. The skin was everywhere implicated; and, with the exception of the scalp, offered nearly the same appearances throughout. In this locality numerous masses of thick and hardened cuticle might be noticed attached either to the surface or scattered among the hair, which was no means deficient in quantity. Over the trunk and limbs generally, the skin was of a colour inclining to pink, and studded with flakes of epidermis, transparent as tissue-paper. On the loins, the latter were placed in nearly parallel rows, but in front no such regularity was maintained. About the elbows and knees the cutis was inclined to crack; and this result occasionally happened in winter from exposure. The hands were much swollen in either aspect; but this did not proceed from any infiltration of fluid in the subcutaneous tissue, as the skin yielded like a piece of parchment on the application of the least pressure; and was moreover smooth, and, as it were, tightly drawn. Nor was this condition confined to the hand, as several parts of the trunk were in like manner affected. The second and last phalanges of the three smaller fingers were altogether wanting in the left hand, while the first were reduced to conical stumps, covered with skin, and deficient in any semblance of a nail. This latter appendage, although present on the thumb and index finger of the left, and on all the digits of the right hand, was so irregular and distorted that it could no longer be recognised apart.

The same smoothness and swelling described on the hands was also seen on the dorsal aspect of the feet; and on the soles the last stage of cutaneous thickening was attained, the skin in this locality being of a